

**CLAIMS**

1. An isolated polynucleotide being selected from the group consisting of:
  - 5 a. a polynucleotide encoding a BMP-2 inducible kinase polypeptide comprising an amino acid sequence selected from the group consisting of:
    - i. amino acid sequences which are at least about 72% identical to the amino acid sequence shown in SEQ ID NO: 2; and
    - 10 ii. the amino acid sequence shown in SEQ ID NO: 2.
    - iii. amino acid sequences which are at least about 72% identical to the amino acid sequence shown in SEQ ID NO: 4; and
    - iv. the amino acid sequence shown in SEQ ID NO: 4.
  - 15 b. a polynucleotide comprising the sequence of SEQ ID NOS: 1 or 3;
  - c. a polynucleotide which hybridizes under stringent conditions to a polynucleotide specified in (a) and (b) and encodes a BMP-2 inducible kinase polypeptide;
  - 20 d. a polynucleotide the sequence of which deviates from the polynucleotide sequences specified in (a) to (c) due to the degeneration of the genetic code and encodes a BMP-2 inducible kinase polypeptide; and
  - 25 e. a polynucleotide which represents a fragment, derivative or allelic variation of a polynucleotide sequence specified in (a) to (d) and encodes a BMP-2 inducible kinase polypeptide.
- 30 2. An expression vector containing any polynucleotide of claim 1.

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3. A host cell containing the expression vector of claim 2.
4. A substantially purified BMP-2 inducible kinase polypeptide encoded by a polynucleotide of claim 1.
5. A method for producing a BMP-2 inducible kinase polypeptide, wherein the method comprises the following steps:
  - 10 a. culturing the host cell of claim 3 under conditions suitable for the expression of the BMP-2 inducible kinase polypeptide; and
  - b. recovering the BMP-2 inducible kinase polypeptide from the host cell culture.
- 15 6. A method for detection of a polynucleotide encoding a BMP-2 inducible kinase polypeptide in a biological sample comprising the following steps:
  - 20 a. hybridizing any polynucleotide of claim 1 to a nucleic acid material of a biological sample, thereby forming a hybridization complex; and
  - b. detecting said hybridization complex.
- 25 7. The method of claim 6, wherein before hybridization, the nucleic acid material of the biological sample is amplified.
8. A method for the detection of a polynucleotide of claim 1 or a BMP-2 inducible kinase polypeptide of claim 4 comprising the steps of:

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- a. contacting a biological sample with a reagent which specifically interacts with the polynucleotide or the BMP-2 inducible kinase polypeptide and
  - 5 b. detecting the interaction
9. A diagnostic kit for conducting the method of any one of claims 6 to 8.
10. A method of screening for agents which decrease the activity of a BMP-2 inducible kinase, comprising the steps of:
- a. contacting a test compound with any BMP-2 inducible kinase polypeptide encoded by any polynucleotide of claim 1;
  - 15 b. detecting binding of the test compound to the BMP-2 inducible kinase polypeptide, wherein a test compound which binds to the polypeptide is identified as a potential therapeutic agent for decreasing the activity of a BMP-2 inducible kinase.
- 20 11. A method of screening for agents which regulate the activity of a BMP-2 inducible kinase, comprising the steps of:
- a. contacting a test compound with a BMP-2 inducible kinase polypeptide encoded by any polynucleotide of claim 1; and
  - 25 b. detecting a BMP-2 inducible kinase activity of the polypeptide, wherein a test compound which increases the BMP-2 inducible kinase activity is identified as a potential therapeutic agent for increasing the activity of the BMP-2 inducible kinase, and wherein a test compound which decreases the BMP-2 inducible kinase activity of the poly-

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peptide is identified as a potential therapeutic agent for decreasing the activity of the BMP-2 inducible kinase.

12. A method of screening for agents which decrease the activity of a BMP-2  
5 inducible kinase, comprising the step of:

contacting a test compound with any polynucleotide of claim 1 and detecting binding of the test compound to the polynucleotide, wherein a test compound which binds to the polynucleotide is identified as a potential therapeutic agent  
10 for decreasing the activity of BMP-2 inducible kinase.

13. A method of reducing the activity of BMP-2 inducible kinase, comprising the  
step of:

15 contacting a cell with a reagent which specifically binds to any polynucleotide of claim 1 or any BMP-2 inducible kinase polypeptide of claim 4, whereby the activity of BMP-2 inducible kinase is reduced.

14. A reagent that modulates the activity of a BMP-2 inducible kinase polypeptide or a polynucleotide wherein said reagent is identified by the method  
20 of any of the claim 10 to 12.

15. A pharmaceutical composition, comprising:

25 the expression vector of claim 2 or the reagent of claim 14 and a pharmaceutically acceptable carrier.

- 30 16. Use of the expression vector of claim 2 or the reagent of claim 14 in the preparation of a medicament for modulating the activity of a BMP-2 inducible kinase in a disease.

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17. Use of claim 16 wherein the disease is cancer, diabetes, a CNS disorder, COPD, a gastrointestinal disorder or a cardiovascular disorder.